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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/508,042	04/28/2000	KLAUS PAWELZIK	1035-00	8093

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EXAMINER
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STEVENS, THOMAS H

ART UNIT	PAPER NUMBER
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2123

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/508,042

Applicant(s)

PAWELZIK ET AL.

Examiner

Thomas H. Stevens

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 4-14 and 16-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-14 and 16-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☒ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/508,042.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/14/05</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-3, and 15 were cancelled.
2. Claims 4-14 were amended.
3. Claims 16-30 were added.
4. Claims 4-14 and 16-30 were examined.

### ***Non-Final Rejection (2<sup>nd</sup> Office Action)***

#### ***New Examiner***

4. Tom Stevens is presiding over the prosecution in place of William Thomson.

#### ***Priority***

5. Acknowledgment is made of applicants' claim for foreign priority based on an application filed in Germany on 09/15/1997. It is noted, however, that applicant has not filed a certified copy of the 197 40 565.7 application as required by 35 U.S.C. 119(b), thus until such document is provided to the Office, the priority date is 9/11/98.

#### ***Claim Objection***

6. The term "appropriate" in claim 17 is a relative term, which renders the claim indefinite. The term "appropriate" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention.

### ***Claim Interpretation***

Office personnel are to give claims their "**broadest reasonable interpretation**" in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See \*also *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow") .... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed .... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process. [www.dictionary.com](http://www.dictionary.com) defines *superimpose* *to lay or place (something) on or over something else*.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

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8. Claims 4-14 and 16-30 are rejected under 35 U.S.C. 102(a) as being anticipated by Kohlmorgen et al., (Segmentation and Identification of Drifting Dynamical Systems" (hereafter Kohlmorgen). Kohlmorgen discloses a method multiple operating modes in nonstationary times series (abstract).

Per claim 16: A method for detecting modes of a dynamic system (title) with a multiplicity of modes  $s_i$  that each have a set  $\alpha(t)$  of characteristic system parameters, (page 328, 3<sup>rd</sup> paragraph, list examples of parameters, i.e.,  $N=8$ , Resolution = 32) said method being performed with a computer and comprising the following steps:

performing a switch segmentation of a time series (pg.326, Introduction, 1<sup>st</sup> paragraph, 2<sup>nd</sup> last sentence) of at least one system variable  $x(t)$ , in which the switch segmentation is a simulation of a training time series of the system or of the time series to be investigated with several, competing prediction models, detecting predetermined prediction models  $f_i$  (pg. 327, 1<sup>st</sup> paragraph) for system modes  $s_i$  for each system variable  $x(t)$  (pg. 327, 5<sup>th</sup> paragraph) in each time segment of a predetermined minimum length, performing a drift segmentation (pg.328) subsequent to said switch segmentation in which, in each time segment in which there is a transition of the system from a first system mode  $s_i$  to a second system mode  $s_j$ , (pg. 329, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence) a series of mixed prediction models  $g_i$  is detected and produced by linear (pg.327, 4<sup>th</sup> paragraph, lines 3-4 with equation 2), paired superimposition of prediction models (see claim interpretation and Introduction, 1<sup>st</sup> paragraph, line 5 "multilayers")  $f_{ij}$  of the two systems modes  $s_{ij}$ , and performing a prediction of a state of said dynamic

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system directly following to a current state, said prediction being based on the detected current modes.

Per claims 17: A method for detecting modes of a dynamic system (title) with a multiplicity of modes  $s_i$  that each have a set  $\alpha(t)$  of characteristic system parameters, (page 328, 3<sup>rd</sup> paragraph, list examples of parameters, i.e.,  $N=8$ , Resolution = 32) said method being performed with a computer and comprising the following steps: performing a switch segmentation of a time series (pg.326, Introduction, 1<sup>st</sup> paragraph, 2<sup>nd</sup> last sentence) of at least one system variable  $x(t)$ , in which the switch segmentation is a simulation of a training time series of the system or of the time series to be investigated with several, competing prediction models, detecting predetermined prediction models  $f_i$  for system modes  $s_i$  for each system variable  $x(t)$  (pg. 327, 5<sup>th</sup> paragraph) in each time segment of a predetermined minimum length, performing a drift segmentation (pg.328) subsequent to said switch segmentation in which, in each time segment in which there is a transition of the system from a first system mode  $s_i$  to a second system mode  $s_j$ , (pg. 329, 1<sup>st</sup> paragraph, 2<sup>nd</sup> sentence) a series of mixed prediction models  $g_i$  is detected and produced by linear (pg.327, 4<sup>th</sup> paragraph, lines 3-4 with equation 2), paired superimposition of prediction models  $f_{ij}$  of the two systems modes  $s_{ij}$ , and performing a control of said dynamic system, including determining a deviation of a current state of said dynamic system from a set point state and deriving an appropriate control strategy on the basis of said deviation.

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Per claims 4: The method according to claim 16 in which the prediction models are formed by neural networks (pg. 328, 1<sup>st</sup> paragraph) or other models for estimating functions that are each characteristics of a mode  $s$  (pg. 328, 1<sup>st</sup> paragraph) and complete for description of the individual elements of the time series according to predetermined training rules prediction of modes (pg. 326, Introduction section, 2<sup>nd</sup> paragraph, lines 1-3).

Per claims 5 and 20: The method according to claim 16,17 in which the series of mixed system modes (pg. 326, Introduction section, 2<sup>nd</sup> paragraph, lines 1-3)  $g_i$  interpolation parameters  $a$ ,  $b$  according to  $g_i$  (pg. 328, equation 3).

Per claim 6 and 21: The method according to claim 5,20 in which the interpolation parameters are selected according to  $0 < a(s) < 1$  and  $b(s) = 1 - a(s)$  (pg. 328, 2<sup>nd</sup> paragraph).

Per claims 7, 22: The method according to claim 6, 21 restricted to a certain resolution figure  $R$  (pg. 328, equation 4 with paragraph 4).

Per claims 8 and 23: The method according to claim 16,17 in which the series of mixed prediction models  $g_i$  (pg. 328, equation 3) is detected by determining a prediction pg. 327, paragraphs 2 and 3) for each time increment with each of the possible prediction models, resulting in a time-dependent prediction (pg. 328, equations 5-7 with

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paragraph 4 “low prediction cost”) matrix from which a mean prediction error (pg. 327, 6<sup>th</sup> paragraph, lines 7-8) for randomly selected segmentations (title) can be derived, whereby the sought series of mixed prediction models  $g_i$  (pg. 328, equation 3) is the segmentation with the smallest prediction error or the maximum probability.

Per claims 9 and 24: The method according to claim 8, 23 in which the search for the segmentation with the smallest prediction error is made by a dynamic programming technique that is equivalent to the Viterbi algorithm for hidden Markov models, (pg. 328, 4<sup>th</sup> paragraph) whereby an optimum sequence of smallest prediction error models is determined using a minimized cost function  $C^*$  (pg. 329, 2<sup>nd</sup> paragraph) of the prediction and the segmentation (title) is derived inductively from the sequence of prediction models.

Per claims 11, and 26: The method according to claim 16, 17 in which the time series of at least one of the system variables  $x(t)$  comprises a time series of physiological parameters described by the Macky-Glass delay differential equation (pg. 329, 3<sup>rd</sup> paragraph); physiological parameters (pg. 333, 2nd paragraph, line 1).

Per claims 12 and 27: The method according to claim 16, 17 in which the time series of at least one of the systems variables  $x(t)$  (pg. 327, 5<sup>th</sup> paragraph) comprises a time series of physiological parameters development of wake and sleep modes (pg. 333, section 3.3).



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Per claims 13 and 28: The method according to claim 12, 27 physiological parameters comprise of EEG signals (pg. 333, section 3.3).

Per claims 14 and 29: The method according to claim 16,17 time series of speech signals (pg.326, Introduction, 1<sup>st</sup> paragraph, 2<sup>nd</sup> last sentence).

Per claim 18 and 30: The method according to claim 6,21 in which the values a(s) are equidistant (pg.328, 2<sup>nd</sup> paragraph, last sentence).

Per claim 19. (New) The method according to claim 17 in which the prediction models are formed by neural networks (pg. 326, 2<sup>nd</sup> paragraph) or other models for estimating functions that are each characteristic of a mode s and compete for description of the individual elements of the time series (abstract) according to predetermined training rules.

Per claim 25. The method according to claim 16 in which drift segmentation (pg. 333, 1<sup>st</sup> paragraph) is followed by an additional step to reduce the number of prediction models used for modeling where the number of prediction models is reduced sequentially (pg. 333, 1<sup>st</sup> paragraph with pg. 328 1<sup>st</sup> paragraph "nets represent the mixed states"), associated with a determination of the mean prediction error, until a further reduction of the number of prediction models means an increase in the prediction error (pg. 332, figure 3 paragraph, line 6 " (c) Increase of the prediction error when...").

***Section II: Response to Applicants' Arguments (Previous Office Action)***

***Claim Amendments***

9. Examiner acknowledges applicants actions with regard to claims 1-3.

***Information Disclosure Statement***

10. Applicants are thanked for addressing this issue. All references have been considered.

***Objections to the Specification***

11. Examiner acknowledges actions by applicants.

***Claim Objection***

12. Applicants are thanked for addressing this issue. Objection to claim 5 is withdrawn.

***Claim Rejection Under 112 1<sup>st</sup>***

13. Applicants are thanked for addressing this issue. Rejection is withdrawn.

***Claim Rejection Under 112, 2<sup>nd</sup>***

14. Applicants are thanked for addressing this issue. Rejection is withdrawn.

***Clam Rejection Under 101***

15. Applicants are thanked for addressing this issue. Rejection stands.

***Duty to Disclose All Prior Art***

16. A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information, which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by 1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The examiner respectfully requests full copies of the following documents:

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- Muller et al., "Analyzing Physiological Data from Wake-Sleep Transition with Completing Predictors, NOLTA'95: Las Vegas Symposium on Nonlinear Theory and its Applications". 1995 pg. 223-226.
- Muller et al., "Analysis of Switching Dynamics with Competing Neural Networks, IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences, E78-A, No.10, 1995. pg.1306-1315.
- Kohlmorgen et al., "Oscillation and Chaos in a Physiological Control System Science 1997. **197**, 287.
- Kohlmorgen et al., "Competing Predictors Segment and Identity Switching Dynamics" Proceedings of ICANN'94, Springer London, 1045-1048.

### ***Correspondence Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is 571-272-3715, Monday-Friday (8:00 am- 4:30 pm EST).

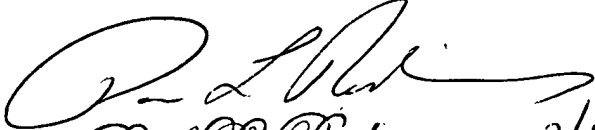
If attempts to reach the examiner by telephone are unsuccessful, please contact examiner's supervisor Mr. Leo Picard ((571) 272-3749). The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Answers to questions regarding access to the Private PAIR system, contact the Electronic Business Center (EBC) (toll-free (866-217-9197)).

February 10, 2006

TS

  
Paul L. Rodriguez 2/17/06  
Primary Examiner  
Art Unit 2125